IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

5 APPLICANT: BENSON, M. EXAMINER: Rampuria, S.

SERIAL NO.: 10/696,042 GROUP: 2617

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ENTITLED: METHOD AND APPARATUS FOR ESTABLISHING DIRECT

COMMUNICATION FOR MOBILES IN A RADIO COMMUNICATION

SYSTEM

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Motorola, Inc.

Intellectual Property Department 600 North U.S. Highway 45 Libertyville, IL 60048

20 APPEAL BRIEF UNDER 37 C.F.R. § 41.37

MS Appeal Brief - Patents
Commissioner for Patents
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Sir:

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Further to the Notice of Appeal filed on August 1, 2007, Applicant submits the present Appeal Brief.

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I. REAL PARTY IN INTEREST

The real party in interest is, Motorola, Inc.

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II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

10 III. STATUS OF CLAIMS

Claims 5-17 and 19 are pending. Claims 5-17 and 19 are rejected and are the subject of the present appeal.

15 IV. STATUS OF AMENDMENTS

No amendments were filed subsequent to final rejection.

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V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 5 is drawn to, for example, a method for operating a radiotelephone system. The method can include at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good (Fig, 2, element 202 and page 7, line 19 - page 8, line 2); at the one or more mobile stations, communicating information about the detected mobile stations to a base station of the radiotelephone system (element 206 and page 8, lines 3 and 5); at a first mobile station, after detecting other mobile stations and after communicating information about the detected mobile stations, requesting communication with a second mobile station (Fig. 3, element 302 and page 8, lines 27 and 28); and at the base station, if the radio propagation conditions between the first mobile station and the second mobile station are sufficiently good, instructing the first mobile station and the second mobile station to establish direct communication (element 308 and page 10, lines 28-31).

Claim 14 is drawn to, for example, a method for operating a base station in a radiotelephone system. The method can include receiving, from respective mobile stations of the radiotelephone system, information about relay candidates of the respective mobile stations (Fig. 1, element 212 and page 8, line 11); storing the information in respective relay candidate lists (element 214 and page 8, lines 16-17); after receiving information about relay candidates and storing the information in respective relay candidate lists, receiving a request from a first mobile station to initiate a call with a second mobile station in the radiotelephone system (Fig. 3, element 304 and page 9, lines 1 and 2); based at least in part on a relay candidate list associated with the first mobile station, determining if the second mobile station is physically close to the first mobile station (element 306 and page 9, lines 3-5); and if so, instructing the first mobile station and the second mobile station to enter a relay mode for direct link communication (element 308 and page 10, lines 28-31).

Claim 17 is drawn to, for example, a radiotelephone (Fig. 1, element 110). The radiotelephone can include a radio communication circuit configured for two-way radio communication with remote radio devices (elements 110, 122, and 124, page 4, lines 1-11, and page 6, lines 25-27); means for detecting other radiotelephones to which radio propagation conditions are sufficiently good (elements 126 and 122, page 6, line 27 - page 7, line 3, page 7, lines 11-15, element 202 and page 7, line 19 - page 8, line 2); and a controller

configured to control the radio communication circuit to establish a radio link to a remote base station to convey a request for communication with another radiotelephone and to receive over the radio link a direct communication instruction generated by the remote base station in dependence on a relay candidate list, and further configured to control the radio communication circuit to interrupt the radio link and establish a relay radio link with the other radiotelephone in response to the direct communication instruction (element 126 and page 6, line 27 - page 7, line 3). The radiotelephone can also include a memory (element 128, page 4, lines 15 and 16) configured to store information about the detected radiotelephones in the relay candidate list (element 204, page 7, lines 20 and 21). The controller can be further configured to control the radio communication circuit to establish a radio link to the remote base station to convey the relay candidate list to the remote base station (element 126 and page 6, line 27 - page 7, line 3).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- 1. Whether claim 5 is allowable under 35 U.S.C. § 102 over Grube et al. (U.S. Patent No. 5,666,661).
- 2. Whether claims 14 and 17 are allowable under 35 U.S.C. § 103 over Grube et al. and Mauney et al. (U.S. Patent No. 6,865,372).

VII. ARGUMENT

Claim 5

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Claim Limitations At Issue

In Claim 5, the limitations at issue are italicized below:

- 5. A method for operating a radiotelephone system, the method comprising: at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good;
- at the one or more mobile stations, communicating information about the detected mobile stations to a base station of the radiotelephone system;

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at a first mobile station, after detecting other mobile stations and after communicating information about the detected mobile stations, requesting communication with a second mobile station; and

at the base station, if the radio propagation conditions between the first mobile station and the second mobile station are sufficiently good, instructing the first mobile station and the second mobile station to establish direct communication.

Examiner's Allegation

Claim 5 stands rejected under 35 U.S.C. § 102(e) over Grube et al.

Applicants' Argument

"A claim is anticipated only if <u>each and every element</u> as set forth in the claim is found, either expressly or inherently described, in a single prior art reference" (MPEP §2131, citing *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)).

Grube does not disclose at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good and at the base station, if the radio propagation conditions between the first mobile station and the second mobile station are sufficiently good, instructing the first mobile station and the second mobile station to establish direct communication.

Grube et al. discloses a method for automatically switching between a direct mode of operation in which two communication units communicate directly and a system mode of operation in which two communication units communicate via a system communication resource. In the method taught in Grube, a communication unit first initiates a call to another communication unit (see Fig. 2 and accompanying description). The communication resource controller 101 then determines the geographic locations of the two communication units and then determines whether the communication units are close enough to establish direct communication therebetween.

Grube discloses a process performed at either a communication unit (102, 103) or a resource controller (101). Grube does not disclose a base station that instructs a mobile

station to establish direct communications based on one or more mobile stations detecting other mobile stations to which radio propagation conditions are sufficiently good. For example, Fig. 2 and col. 3, lines 1-38 of Grube et al. disclose a distance relationship is determined in the resource controller without the communication units making the determination. The resource controller does not use the detection by one or more mobile stations of other mobile stations to which radio propagation conditions are sufficiently good, as claimed in independent claim 5.

Grube et al. does not disclose detecting in a mobile other radio mobile stations to which radio propagation conditions are sufficiently good. Grube et al. discloses determining the distance between first and second radio communication units (201, 301). This is not a determination at a mobile station of whether radio propagation conditions between a first mobile station and a second mobile station are sufficiently good. In particular, even if two mobile stations have a distance relationship that is favorable to a predetermined threshold (202), such a distance does not guarantee radio propagation conditions that are sufficiently good. For example, environmental conditions, such as a wall or other obstacles between two mobile stations, affect radio propagation conditions and such environmental conditions often cause poor radio propagation conditions, regardless of a favorable distance relationship.

The Advisory Action alleged,

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Since Grube teaches, 'Having obtained the distance relationship, the communication resource controller then determines whether that relationship is favorable to a predetermined threshold (202). The predetermined threshold is typically a distance parameter, which is derived from the transmitting power of the communication units when in a direct mode... If the distance relationship is favorable to the predetermined threshold (202), the communication resource controller transmits a mode change message, or a direct mode message, to the communication units (203). The mode change message indicates that the units should switch to, or operate in, a direct mode of operation.' (Grube, Col. 3; 18-34), which corresponds to the claimed limitation as 'At a base station serving the first mobile station, if radio propagation conditions between the first mobile station and the second mobile station are sufficiently good, instructing the first mobile station and the second mobile station to establish direct communication..' Thus, determining the predetermined threshold at the

communication resource controller. (Grube, Col.3; 18-34), is exactly as applicant is rely upon, the determination at a base station (e.g. determination at a base station; Bensen et al, US 20040121766, ¶ 0040), that certainly, anticipated by Grube."

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However, the cited section does not change the fact that Grube does not teach "at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good." Grube teaches a communication resource controller (Fig. 1, element 101), not the communication units (Fig. 1, elements 102 and 103), detects which mobile stations have a favorable relationship to change modes to a direct mode of operation (col. 3, lines 1-9 and lines 29-34). In particular, Grube expressly discloses, "The communication resource controller determines the location of communication units that are engaged in communication" (col. 3, lines 2-4). Grube goes on to disclose, "Having obtained the location, the communication resource controller then determines a distance relationship between the communication units" (col. 3, lines 7-9). Later, Grube discloses, "If the distance relationship is favorable to the predetermined threshold (202), the communication resource controller transmits a mode change message, or a direct mode message, to the communication units (203). The mode change message indicates that the units should switch to, or operate in, a direct mode of operation" (col. 3, lines 29-34). Thus, Grube teaches a communication resource controller (Fig. 1, element 101), not the communication units (Fig. 1, elements 102 and 103), detects which mobile stations have a favorable relationship to change modes to a direct mode of operation (col. 3, lines 1-9 and lines 29-34). Therefore, Grube does not teach "at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good."

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In fact, when quoting Grube, the Advisory Action deleted a section in the middle of the quote (col. 3, lines 23-28). The deleted section, in combination with the above-cited sections, actually supports the fact that Grube does not teach the step of "at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good." In particular, the deleted section states, "For example, Motorola's dual mode radios have a direct mode transmitting range of 0.5 miles to 5 miles. Thus if the distance relationship is greater than 5 miles, the communication units are going to need to remain on, or be granted, a communication system resource." This illustrates how the communication resource controller may have information about the communication

units for determining the distance relationship without the mobile stations detecting other mobile stations to which radio propagation conditions are sufficiently good. For example, even though Grube is silent on how the transmitting range information is obtained at the communication resource controller, the information is an inherent characteristic of the mobile devices that is not determined by a mobile station detecting other mobile stations to which radio propagation conditions are sufficiently good.

The Advisory Action went on to allege,

Moreover, Grube teaches, 'The predetermined threshold is typically a distance parameter which is derived from the transmitting power of the communication units when in a direct mode.' (Grube, Col.3; 18-23), which corresponds to the claimed limitation as 'the radio propagation conditions between the first mobile station and the second mobile station are sufficiently good.' Thus, the transmitting power of the communication units. (Grube, Col.3; 18-23), is exactly as applicant is [relying] upon, the radio propagation conditions (e.g. the radio propagations conditions; [Benson] et al., US 20040121766, ¶ 0040), that certainly, anticipated by Grube.

Again, the cited sections do not change the fact that Grube does not teach "at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good." As discussed above, Grube teaches a communication resource controller (Fig. 1, element 101), not the communication units (Fig. 1, elements 102 and 103), detects which mobile stations have a favorable relationship to change modes to a direct mode of operation (col. 3, lines 1-9 and lines 29-34).

Furthermore, even if one were to inappropriately construe the transmitting power as a radio propagation condition, it would only be one propagation condition, not the claimed plural radio propagation conditions. Regardless of such a misconstruction alleged by the Advisory Action, Grube does not teach "at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good."

Applicants note that Grube does disclose an alternative to the resource controller making the determination by implementing the invention into a communication unit (Fig. 3 and col. 3, line 53 - col. 4, line 9). However, the alternative only discloses a method

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performed at a communication unit that does not use the resource controller. Thus, the alternative does not disclose, "communicating information about the detected mobile stations to a base station of the radiotelephone system." Furthermore, the alternative only discloses determining a distance between units using a location receiver at each unit. The alternative does not disclose, "at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good."

Additionally, the alternative only discloses using a single distance determination to switch to a direct mode of operation based on a threshold comparison. The alternative does not disclose the claimed plural radio propagation conditions.

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Thus, Grube et al. fails to teach at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good and at a base station, if the radio propagation conditions between the first mobile station and the second mobile station are sufficiently good, instructing the first mobile station and the second mobile station to establish direct communication as recited in independent claim 5.

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Claim 14

Claim Limitations At Issue

In Claim 14, the limitations at issue are italicized below:

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14. *A method for operating a base station* in a radiotelephone system, the method comprising:

receiving, from respective mobile stations of the radiotelephone system, information about relay candidates of the respective mobile stations;

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storing the information in respective relay candidate lists;

after receiving information about relay candidates and storing the information in respective relay candidate lists, receiving a request from a first mobile station to initiate a call with a second mobile station in the radiotelephone system;

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based at least in part on a relay candidate list associated with the first mobile station, determining if the second mobile station is physically close to the first mobile station; and

if so, instructing the first mobile station and the second mobile station to enter a relay mode for direct link communication.

Examiner's Allegation

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Claim 14 stands rejected under 35 U.S.C. § 103 over Grube et al. and Mauney et al.

Applicants' Argument

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To establish a *prima facie* case of obviousness... the prior art references, when combined, must teach or suggest <u>all of the claim limitations</u> (MPEP 2142).

Applicants assert neither Grube et al. nor Mauney et al. disclose a method for operating a base station in a radiotelephone system, the method comprising at least receiving, from respective mobile stations of the radiotelephone system, information about relay candidates of the respective mobile stations, storing the information in respective relay candidate lists, and instructing a first mobile station and a second mobile station to enter a relay mode for direct link communication.

Grube et al. discloses a method for automatically switching between a direct mode of operation in which two communication units communicate directly and a system mode of operation in which two communication units communicate via a system communication resource. In the method taught in Grube, a communication unit first initiates a call to another communication unit (see Fig. 2 and accompanying description). The communication resource controller 101 then determines the geographic locations of the two communication units and then determines whether the communication units are close enough to establish direct communication therebetween.

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Grube does not disclose anything about a method for operating a base station in a radiotelephone system, the method comprising at least receiving, from respective mobile stations of the radiotelephone system, information about relay candidates of the respective mobile stations, storing the information in respective relay candidate lists, and instructing the first mobile station and the second mobile station to enter a relay mode for direct link communication and such is admitted by the Office Actions.

Mauney et al. fails to make up for the deficiencies of Grube. In particular, Mauney et al. does not disclose any method for operating a base station using relay candidate lists. Every embodiment of Mauney et al. is directed to methods performed in a wireless handset. For example, every embodiment of performing a find request with respect to a found list is performed within a handset and the found list is stored in the handset, not in a base station (Figs 9A-16B, 39A, and 39B and col. 31, line 5 - col. 50, line 27). Furthermore, because Mauney et al. does not disclose the method for operating a base station, Mauney et al. does not disclose instructing the first mobile station and the second mobile station to enter a relay mode for direct link communication. Any instructions in Mauney et al. would be sent from one handset to the other for operating in its handset-to-handset communication mode. They would not instruct the first mobile station and the second mobile station to enter a relay mode for direct link communication. Thus, Mauney et al. does not disclose any method for operating a base station using relay candidate lists and instructing a first mobile station and a second mobile station to enter a relay mode for direct link communication.

Therefore neither Grube et al. nor Mauney et al. disclose a method for operating a base station in a radiotelephone system, the method comprising at least receiving, from respective mobile stations of the radiotelephone system, information about relay candidates of the respective mobile stations, storing the information in respective relay candidate lists, and instructing a first mobile station and a second mobile station to enter a relay mode for direct link communication.

Claim 17

Claim Limitations At Issue

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17. A radiotelephone comprising:

a radio communication circuit configured for two-way radio communication with remote radio devices;

means for detecting other radiotelephones to which radio propagation conditions are sufficiently good; and

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a controller configured to control the radio communication circuit to establish a radio link to a remote base station to convey a request for communication with another radiotelephone and to receive over the radio link a direct communication instruction generated

by the remote base station in dependence on a relay candidate list, and further configured to control the radio communication circuit to interrupt the radio link and establish a relay radio link with the other radiotelephone in response to the direct communication instruction,

wherein the radio telephone further comprises:

a memory configured to store information about the detected radiotelephones in the relay candidate list,

the controller being further configured to control the radio communication circuit to establish a radio link to the remote base station to convey the relay candidate list to the remote base station.

Examiner's Allegation

Claim 17 stands rejected under 35 U.S.C. § 103 over Grube et al. and Mauney et al.

Applicants' Argument

To establish a *prima facie* case of obviousness... the prior art references, when combined, must teach or suggest <u>all of the claim limitations</u> (MPEP 2142).

Applicants assert neither Grube et al. nor Mauney et al. disclose establishing a radio link to a remote base station to convey a relay candidate list to the remote base station.

Grube et al. does not disclose anything about a relay candidate list and such is admitted by the Office Actions. Because Grube et al. does not disclose anything about a relay candidate list, Grube et al. cannot disclose conveying a relay candidate list to the remote base station. For example, Grube et al. only discloses a communication resource controller (Fig. 1, element 101), not the communication units (Fig. 1, elements 102 and 103), detects which mobile stations have a favorable relationship to change modes to a direct mode of operation (col. 3, lines 1-9 and lines 29-34). In particular, Grube expressly discloses, "The communication resource controller determines the location of communication units that are engaged in communication" (col. 3, lines 2-4). Grube goes on to disclose, "Having obtained the location, the communication resource controller then determines a distance relationship between the communication units" (col. 3, lines 7-9). Later, Grube discloses, "If the distance relationship is favorable to the predetermined threshold (202), the communication resource

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controller transmits a mode change message, or a direct mode message, to the communication units (203). The mode change message indicates that the units should switch to, or operate in, a direct mode of operation" (col. 3, lines 29-34). Thus, Grube teaches a communication resource controller (Fig. 1, element 101), not the communication units (Fig. 1, elements 102 and 103), detects which mobile stations have a favorable relationship to change modes to a direct mode of operation (col. 3, lines 1-9 and lines 29-34). Because the communication resource controller performs the detection, the communication units do not send any information about a relay candidate list to the communication resource controller.

Mauney et al. fails to make up for the deficiencies of Grube et al. In particular, Mauney et al. does not disclose anything about conveying a relay candidate list to a base station. In Mauney et al., every embodiment of performing a find request with respect to a found list is performed within a handset and the found list is stored in the handset, not in a base station (Figs 9A-16B, 39A, and 39B and col. 31, line 5 - col. 50, line 27). There is no communication of the found list from the handset to a base station. All of the embodiments disclose steps are only performed at the handset without any communication with a base station. Thus, Mauney et al. does not disclose anything about conveying a relay candidate list to a base station. Consequently, neither Grube et al. nor Mauney et al. disclose establishing a radio link to a remote base station to convey a relay candidate list to the remote base station.

Therefore, Applicants respectfully submit that independent claims 5, 14, and 17 define patentable subject matter. The remaining claims depend from the independent claims and therefore also define patentable subject matter. Accordingly, Applicants respectfully request the withdrawal of the rejections under 35 U.S.C. § 102 and 35 U.S.C. § 103.

CONCLUSION

In view of the discussion above, the claims of the present application are in condition for allowance. Kindly withdraw any rejections and objections and allow this application to issue as a United States Patent without further delay.

Respectfully submitted,

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VIII. CLAIMS APPENDIX

Claims involved in the appeal:

1-4. (canceled)

5. A method for operating a radiotelephone system, the method comprising: at one or more mobile stations of the radiotelephone system, detecting other mobile stations to which radio propagation conditions are sufficiently good;

at the one or more mobile stations, communicating information about the detected mobile stations to a base station of the radiotelephone system;

at a first mobile station, after detecting other mobile stations and after communicating information about the detected mobile stations, requesting communication with a second mobile station; and

at the base station, if the radio propagation conditions between the first mobile station and the second mobile station are sufficiently good, instructing the first mobile station and the second mobile station to establish direct communication.

6. The method of claim 5 further comprising:

at the base station, receiving the communication request from the first mobile station; and

from the information about the detected mobile stations from the first mobile station and the second mobile station, determining if the first mobile station and the second mobile station may initiate direct communication.

7. The method of claim 5 further comprising:

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determining if each of the first mobile station and the second mobile station is a detected mobile of the other mobile station.

8. The method of claim 6 further comprising:

at the base station, determining a location of the first mobile station;

determining a location of the second mobile station; and

determining information about relative proximity of the first mobile station and

the second mobile station based on the location of the first mobile station and the location of

the second mobile station.

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9. The method of claim 5 wherein instructing the first mobile station and the second mobile station to establish direct communication comprises:

initiating a first communication link between the base station and the first mobile station;

communicating a direct communication instruction to the first mobile station;

initiating a second communication link between the base station and the second

mobile station:

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communicating a direct communication instruction to the second mobile

station;

terminating the first communication link and the second communication link.

detecting respective uplink transmissions from respective mobile stations to

The method of claim 5 wherein detecting other mobile stations comprises:

base stations of the radiotelephone system.

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11. The method of claim 10 wherein detecting other mobile stations further comprises:

determining a received signal strength for a detected uplink transmission from a mobile station;

if the received signal strength exceeds a threshold, identifying the mobile station as a detected mobile station.

12. The method of claim 5 further comprising:

at the first mobile station, in response to the instruction to establish direct communication, entering a packet-based connectionless communication mode with the second mobile station.

- 13. The method of claim 12 wherein packet-based connectionless communication mode comprises entering an Opportunity Driven Multiple Access relay mode.
- 14. A method for operating a base station in a radiotelephone system, the method comprising:

receiving, from respective mobile stations of the radiotelephone system, information about relay candidates of the respective mobile stations;

storing the information in respective relay candidate lists;

after receiving information about relay candidates and storing the information in respective relay candidate lists, receiving a request from a first mobile station to initiate a call with a second mobile station in the radiotelephone system;

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based at least in part on a relay candidate list associated with the first mobile station, determining if the second mobile station is physically close to the first mobile station; and

if so, instructing the first mobile station and the second mobile station to enter a relay mode for direct link communication.

15. The method of claim 14 wherein instructing the first mobile station and the second mobile station to enter a relay mode comprises:

communicating information about the relay mode a over a first link with the first mobile station;

communicating information about the relay mode a over a second link with the second mobile station; and

terminating both the first link and the second link.

15 16. The method of claim 14 further comprising:

receiving from respective mobile stations of the radiotelephone system information about relay candidates of the respective mobile stations;

storing the information in respective relay candidate lists; and receiving updates from the respective mobile stations for updating the respective relay candidate lists.

17. A radiotelephone comprising:

a radio communication circuit configured for two-way radio communication with remote radio devices;

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means for detecting other radiotelephones to which radio propagation conditions are sufficiently good; and

a controller configured to control the radio communication circuit to establish a radio link to a remote base station to convey a request for communication with another radiotelephone and to receive over the radio link a direct communication instruction generated by the remote base station in dependence on a relay candidate list, and further configured to control the radio communication circuit to interrupt the radio link and establish a relay radio link with the other radiotelephone in response to the direct communication instruction,

wherein the radio telephone further comprises:

a memory configured to store information about the detected radiotelephones in the relay candidate list,

the controller being further configured to control the radio communication circuit to establish a radio link to the remote base station to convey the relay candidate list to the remote base station.

18. (canceled)

19. The radiotelephone of claim 17 wherein the controller is further configured to control the radio communication circuit to detect uplink radio transmissions from other radiotelephones and, in response to the detected uplink transmissions, to populate the relay candidate list.

EVIDENCE APPENDIX (none)

RELATED PROCEEDINGS APPENDIX (none)